



Demonstration Booklet

2000 — Grades 4 & 8

Mathematics and Science

State

School and Teacher Information

SCHOOL #

TEACHER #

PERIOD #

Birth Date

Sex

R/E

NSLP

Title I

SD

LEP

Admin
Code

Month

Year

1 = Male
2 = Female

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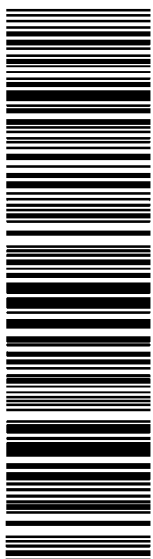
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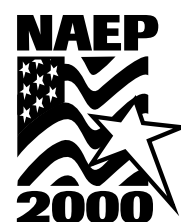
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**DEMONSTRATION
BOOKLET
GRADES 4 AND 8
STATE**

MATHEMATICS AND SCIENCE



NAEP 2000 ASSESSMENT
NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS
MATHEMATICS AND SCIENCE
FOURTH AND EIGHTH GRADES —STATE

TABLE OF CONTENTS

A Message for School Staff Members	4
--	---

GRADE 4

Mathematics

A Description of the Assessment	7
Mathematics Booklet Directions	8
Sample Questions	10
General Background Questionnaire	15
Mathematics Background Questionnaire	18

Science

A Description of the Assessment	22
Science Booklet Directions, I.....	23
Science Booklet Directions, II	25
Sample Questions	26
Science Background Questionnaire Directions	32
General Background Questionnaire	33
Science Background Questionnaire	36

GRADE 8

Mathematics

A Description of the Assessment	41
Mathematics Booklet Directions	42
Sample Questions	44
General Background Questionnaire	48
Mathematics Background Questionnaire	52

Science

A Description of the Assessment	58
Science Booklet Directions, I.....	59
Science Booklet Directions, II	61
Sample Questions	62
Science Background Questionnaire Directions	66
General Background Questionnaire	67
Science Background Questionnaire	71

Information about National Assessment of Educational Progress	Back Cover
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A MESSAGE FOR SCHOOL STAFF MEMBERS

On behalf of the NAEP project team, I want to thank you and other members of your school system for agreeing to participate in the NAEP assessment. Your participation is essential and valued. NAEP's benchmark data about student achievement and instructional emphases are widely used for staff development, curriculum planning, and research on student performance. Your voluntary assistance enhances a cooperative partnership with school leaders across the country who believe that information about this nation's educational progress is a critical ingredient for public and professional discussion about policy and direction. Your assistance also contributes to our success in measuring what students know and can do.

This demonstration booklet illustrates the kinds of exercises or test questions and tasks used in this assessment of student achievement in mathematics and science. Each student will be asked to complete the background section and the cognitive sections for one subject. The length of the assessment will require about 90 minutes of a student's time.

This booklet is divided into three parts. Part one contains a description of the grade 4 mathematics and science assessments, followed by the booklet directions, sample questions, and the background questionnaires that are included in mathematics and science test booklets. Part two contains the same information for the grade 8 mathematics and science assessments.

Students will be asked about their racial and ethnic background, their parents' level of education, the number of educational materials in the home, and the amount of time they spend on homework each day. Questionnaires also address how the subject matter is taught, the materials and resources the students use, and whether the students believe the particular subject matter is useful in their lives and for the future. This information is confidential; student's names never leave the school.

The samples of mathematics and science questions are representative of those in the assessment. Although the actual questions in the assessment must be safeguarded to maintain the integrity of the assessment and resulting data, the sample items are intended to convey the kinds of questions and formats that are part of the assessment.

The third part of the booklet is located on the back cover and contains information about the program's purpose and how to obtain access to NAEP questions for further review.

Again, the project team appreciates your willingness to allow NAEP to conduct the assessment at your institution.

Peggy G. Carr, Associate Commissioner
Education Assessment
National Center for Education Statistics

GRADE 4

THE MATHEMATICS ASSESSMENT

The NAEP mathematics assessment is based on the National Council of Teachers of Mathematics (NCTM) *Standards*. The specifications focus on five broad content strands of mathematical content: Number Sense, Properties, and Operations; Measurement; Geometry and Spatial Sense; Data Analysis, Statistics, and Probability; and Algebra and Functions. Items are classified according to the major area(s) they address, including both mathematical abilities and mathematical power. Mathematical power consists of math abilities (conceptual understanding, procedural knowledge, and problem solving) within a broader context of reasoning, connections, and communications.

The 2000 NAEP assessment embraces a comprehensive view of mathematics and is based on a model that provides a more holistic and integrated view of school mathematics, requiring students to form networks of connections among mathematical ideas and skills.

The exercise types include multiple-choice items, grid-in items, short-answer open-ended questions, and extended open-ended tasks. These extended exercises allow students to communicate their ideas and demonstrate the reasoning they used to solve problems.

MATHEMATICS BOOKLET DIRECTIONS

This assessment uses many different booklets. Each booklet has different questions. Do not worry if the person next to you is working on questions that do not look like those you are working on.

Read each question carefully and answer it as well as you can. Do not spend too much time on any one question.

Each booklet has several parts. You will be helped with the first part and will complete the other parts on your own. You will be told when to begin each part. Stop when you see this sign.



If you finish a part early, you may check your work on that part only. Do not begin another part until you are told to continue.

Now read sample 1. The choices for some questions will be written across the page as shown. Fill in the oval for the best answer.

SAMPLE 1

	Almost every day	Once or twice a week	Once or twice a month	Never or hardly ever
1. How often do you watch movies on TV?	(A)	(B)	(C)	(D)

There is no correct answer to this question. Your answer will tell us how often you watch movies on TV.

Now read sample 2 and write your answer on the blank line below.

SAMPLE 2

2. What kind of food do you like best?

(Write in.) _____

You should answer this question by writing the kind of food you like best. Sometimes there will be more than one line on which to write your answer. Use as many lines as you need for your answer.

Now read sample 3. Fill in the oval beside the choice that you think is correct.

SAMPLE 3

2. How many minutes are there in 1 hour?

☐ A 12

☐ B 24

☐ C 30

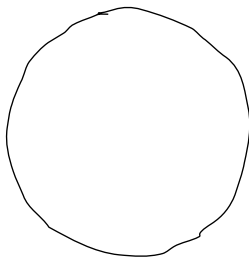
☐ D 60

You should have filled in the oval for “60” because there are 60 minutes in an hour.

Now read sample 4. For some of the questions you may need to write or draw the answer. You can see how this is done in sample 4.

SAMPLE 4

4. Draw a circle in the space below.



REMEMBER:

Read each question CAREFULLY.

Fill in only ONE OVAL for each question or write your answer in the space provided.

If you change your answer, ERASE your first answer COMPLETELY.

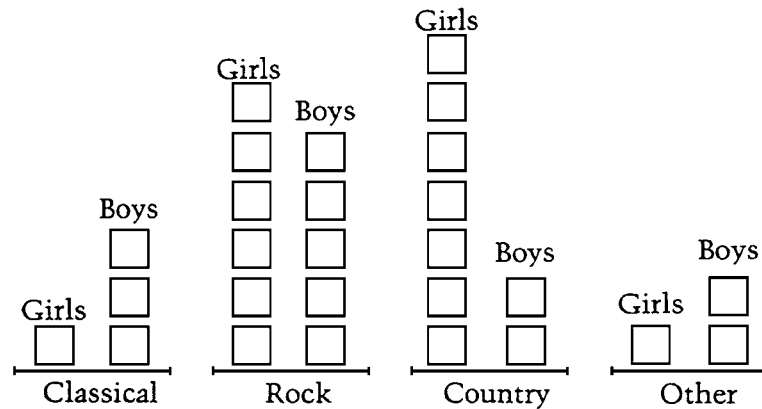
CHECK OVER your work if you finish a section early.



SAMPLE QUESTIONS

1. Each boy and girl in the class voted for his or her favorite kind of music. Here are the results.

☐ = 1 student



Which kind of music did most students in the class prefer?

- (A) Classical
- (B) Rock
- (C) Country
- (D) Other

AP000554

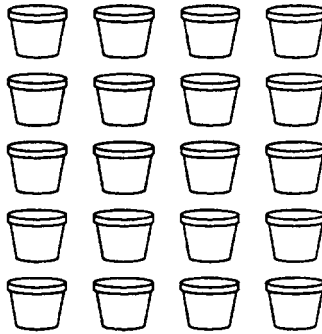
2. Brett needs to cut a piece of string into four equal pieces without using a ruler or other measuring instrument.

Write directions to tell Brett how to do this.

EL001540

3. Sam can purchase his lunch at school. Each day he wants to have juice that costs 50¢, a sandwich that costs 90¢, and fruit that costs 35¢. His mother has only \$1.00 bills. What is the least number of \$1.00 bills that his mother should give him so he will have enough money to buy lunch for 5 days?

AP000522



4. The picture shows the flowerpots in which Kevin will plant flower seeds. He needs 3 seeds for each pot. Which of the following number sentences shows how many seeds Kevin will need for all of the pots?

(A) $5 \times 4 \times 3 = \square$

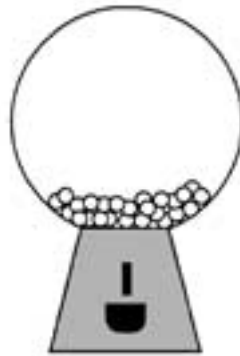
(B) $(5 \times 4) + 3 = \square$

(C) $(5 + 4) \times 3 = \square$

(D) $5 + 4 + 3 = \square$

M000502

Think carefully about the following question. Write a complete answer. You may use drawings, words, and numbers to explain your answer. Be sure to show all of your work.



20 yellow
30 blue
50 red

5. The gum ball machine has 100 gum balls; 20 are yellow, 30 are blue, and 50 are red. The gum balls are well mixed inside the machine.

Jenny gets 10 gum balls from this machine.

What is your best prediction of the number that will be red?

Answer: _____ gum balls

Explain why you chose this number.

AP000528



GENERAL BACKGROUND QUESTIONNAIRE

This section has 17 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

1. Which best describes you?

- ☐ (A) White (not Hispanic)
- ☐ (B) Black (not Hispanic)
- ☐ (C) Hispanic (“Hispanic” means someone who is from a Mexican, Mexican American, Chicano, Puerto Rican, Cuban, or other Spanish or Hispanic background.)
- ☐ (D) Asian or Pacific Islander (“Asian or Pacific Islander” means someone who is from a Chinese, Japanese, Korean, Filipino, Vietnamese, or other Asian or Pacific Island background.)
- ☐ (E) American Indian or Alaskan Native (“American Indian or Alaskan Native” means someone who is from one of the American Indian tribes, or one of the original people of Alaska.)
- ☐ (F) Other (specify)_____

TB003101

2. If you are Hispanic, what is your Hispanic background?

- ☐ (A) I am not Hispanic.
- ☐ (B) Mexican, Mexican American, or Chicano
- ☐ (C) Puerto Rican
- ☐ (D) Cuban
- ☐ (E) Other Spanish or Hispanic background

LC000006

3. How long have you lived in the United States?

- ☐ (A) All my life
- ☐ (B) More than 5 years but not all my life
- ☐ (C) 3–5 years
- ☐ (D) Less than 3 years

TB003201

4. How often do the people in your home speak a language other than English?

- ☐ (A) Never
- ☐ (B) Sometimes
- ☐ (C) Always

TB000905

8. Does your family get any magazines regularly?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB000901

5. Does your family get a newspaper regularly?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB001801

9. How much television do you usually watch each day?

- ☐ (A) None
- ☐ (B) 1 hour or less
- ☐ (C) 2 hours
- ☐ (D) 3 hours
- ☐ (E) 4 hours
- ☐ (F) 5 hours
- ☐ (G) 6 hours or more

TB000903

6. Is there an encyclopedia in your home?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB000904

7. Are there more than 25 books in your home?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB006601

10. How much time do you usually spend on homework each day?

- ☐ (A) I don't usually have homework assigned.
- ☐ (B) I have homework but I don't usually do it.
- ☐ (C) 1/2 hour or less
- ☐ (D) 1 hour
- ☐ (E) More than 1 hour

TB001101

HE000717

11. About how many pages a day do you have to read in school and for home-work?

- ☐ (A) More than 20
- ☐ (B) 16–20
- ☐ (C) 11–15
- ☐ (D) 6–10
- ☐ (E) 5 or fewer

14. How often do you discuss things you have studied in school with someone at home?

- ☐ (A) Almost every day
- ☐ (B) Once or twice a week
- ☐ (C) Once or twice a month
- ☐ (D) Never or hardly ever

TS004001

HE002795

12. How many days of school did you miss last month?

- ☐ (A) None
- ☐ (B) 1 or 2 days
- ☐ (C) 3 or 4 days
- ☐ (D) 5 to 10 days
- ☐ (E) More than 10 days

15. How often do you use a computer at home for schoolwork?

- ☐ (A) Almost every day
- ☐ (B) Once or twice a week
- ☐ (C) Once or twice a month
- ☐ (D) Never or hardly ever
- ☐ (E) There is no computer at home.

HE000712

ID110020

13. Within the past two years, how many times have you changed schools because you changed where you lived?

- ☐ (A) None
- ☐ (B) 1
- ☐ (C) 2
- ☐ (D) 3 or more

16. Do you use the Internet at home?

- ☐ (A) Yes
- ☐ (B) No

HE002541

17. How safe do you feel at school?

- ☐ (A) Very safe
- ☐ (B) Somewhat safe
- ☐ (C) Somewhat unsafe
- ☐ (D) Very unsafe



MATHEMATICS BACKGROUND QUESTIONNAIRE

This section has 6 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

UH000080

1. When you do mathematics in school, how often do you do each of the following?
Fill in only **one** oval on each line.

	Almost Every Day	Once or Twice a Week	Once or Twice a Month	Never or Hardly Ever	
a. Do mathematics problems from textbooks	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810101
b. Solve mathematics problems with a partner or in small groups	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	HE002478
c. Work with objects like rulers, counting blocks, or geometric shapes	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810112
d. Write a few sentences about how you solved a mathematics problem	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810109
e. Talk with other students during class about how you solved mathematics problems	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070695
f. Use a computer	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810106
g. Use a calculator	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810105

HE000378

2. Do you have a calculator that you can use to do mathematics schoolwork?

- ☐ A Yes
☐ B No

LC000518

3. For mathematics, how often do you use a calculator for each of the following activities?
Fill in **one** oval on each line.

	Almost Every Day	Once or Twice a Week	Once or Twice a Month	Never or Hardly Ever	
a. Classwork	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	LC000519
b. Homework	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	LC000520
c. Tests or quizzes	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	LC000521

TM810601

4. About how much time do you usually spend each day on mathematics homework?

- ☐ A None
- ☐ B 15 minutes
- ☐ C 30 minutes
- ☐ D 45 minutes
- ☐ E One hour
- ☐ F More than one hour

HE000705

5. Do you get extra help in mathematics from a special teacher, teacher aide, or tutor?

- ☐ A Yes
- ☐ B No

HE000648

6. How much do you agree with each of the following statements? Fill in **one** oval on each line.

	Agree	Undecided	Disagree	
a. I like mathematics.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	TM811101
b. I am good at mathematics.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	TM811103
c. I understand most of what goes on in mathematics class.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE000651
d. There is only one correct way to solve a mathematics problem.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE002482
e. Learning mathematics is mostly memorizing facts.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE000654
f. Mathematics is useful for solving everyday problems.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	TM811105
g. All students can do well in mathematics if they try.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	QK070696

This section has 3 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

QK070694

1. How hard did you try on this test?

- ☐ (A) Much harder than on other mathematics tests
- ☐ (B) Harder than on other mathematics tests
- ☐ (C) About as hard as on other mathematics tests
- ☐ (D) Not as hard as on other mathematics tests

LD001718

2. How important was it to you to do well on this mathematics test?

- ☐ (A) Very important
- ☐ (B) Important
- ☐ (C) Somewhat important
- ☐ (D) Not very important

LD001718

3. How strongly do you agree with the following statements? Fill in only **one** oval on each line.

- | | Strongly
Agree | Agree | Disagree | Strongly
Disagree | |
|--|---------------------------|---------------------------|---------------------------|------------------------------|----------|
| a. Doing well in school is a goal of most students in my class. | <input type="radio"/> (A) | <input type="radio"/> (B) | <input type="radio"/> (C) | <input type="radio"/> (D) | ID110146 |
| b. To keep up with my friends, I have to work hard at my schoolwork. | <input type="radio"/> (A) | <input type="radio"/> (B) | <input type="radio"/> (C) | <input type="radio"/> (D) | ID110147 |



THE SCIENCE ASSESSMENT

The NAEP science assessment is organized according to two major dimensions: the fields of science (Earth, Physical, and Life) and knowing and doing science (Conceptual Understanding, Scientific Investigation, and Practical Reasoning). In addition, embedded within both dimensions are three themes of science (Models, Systems, and Patterns of Change) and the Nature of Science.

The 2000 NAEP assessment in science contains multiple-choice questions as well as short and extended constructed-response exercises. These questions explore students' abilities to explain, integrate, apply, reason, plan, design, evaluate, and communicate. The constructed-response questions make up approximately 80 percent of the assessment time.

The assessment is made up of discrete questions; clusters of questions that test in-depth knowledge of a number of content areas including those contained within systems, models, and patterns of change; and performance-based tasks that probe students' abilities to make observations, perform investigations, evaluate experimental results, and apply problem-solving skills.

Each student who participates in the assessment will take two timed blocks of questions. In addition, half the sampled students will take a third timed block of questions consisting of a set of hands-on problem-solving tasks.


**Distribution of NAEP Science Framework Assessment Time
Across Field of Science**

	Earth Science includes astronomy, geology, meteorology, and oceanography	Physical Science includes physics and chemistry	Life Science includes biology, health, and nutrition
Grade 4	33%	33%	33%
Grade 8	30%	30%	40%
Grade 12	33%	33%	33%

SCIENCE

BOOKLET DIRECTIONS, I

Your book has either 4 or 5 sections. Sections 1 and 2 contain science questions; sections 3 and 4 ask questions about you and your classes. For those of you who have 5 sections, section 5 contains a hands-on science task. The administrator will tell you when to begin each section.

Do not go past the  sign at the end of each section until you are told to do so.

If you finish a section before time is called, you may go back and check your work on that section only. Use your time carefully and answer as many questions as you can in each section.

In each of sections 1 and 2, you will have 20 minutes to answer a series of questions about science.

You will be asked to respond to several different types of questions. Some of the questions will require you to choose the best answer and fill in the oval for that answer in your booklet. On questions like this, be sure to mark your answers clearly and darken the oval completely. If you make a mistake or want to change your answer, be sure to erase any unwanted marks. Here is an example of a question that requires you to fill in an oval.

Example 1

James found that certain objects were attracted to a magnet. Which of these objects clung to his magnet?

- ☐ (A) Rubber band
- ☐ (B) Wooden toothpick
- ☐ (C) Plastic cup
- ☒ (D) Steel paper clip

For some questions, you will be asked to write short answers on the blank lines provided in your booklet. Here is an example of a question that requires you to provide a short answer.

Example 2

Describe one important difference between plants and animals.

Most plants make their own food, while animals eat plants and other animals for food.

Also, you will be asked to answer some questions by writing longer, more detailed responses. For example, here is a question that requires you to provide a longer answer.

Example 3

Describe three things that animals do to survive in areas that have cold winters.

Some animals store a lot of fat so that they can go into a deep sleep all winter. Some animals grow a thick coat of fur to keep them warm. Some birds and butterflies fly away from a cold area and spend the winter in a place that is warm and has a lot of food.

When you are asked to write your response be sure that your handwriting is clear. Think carefully about each question and make your answers as complete as possible, using as many lines as you need.

Finally, in some questions you may be asked to draw a diagram or fill in a table.



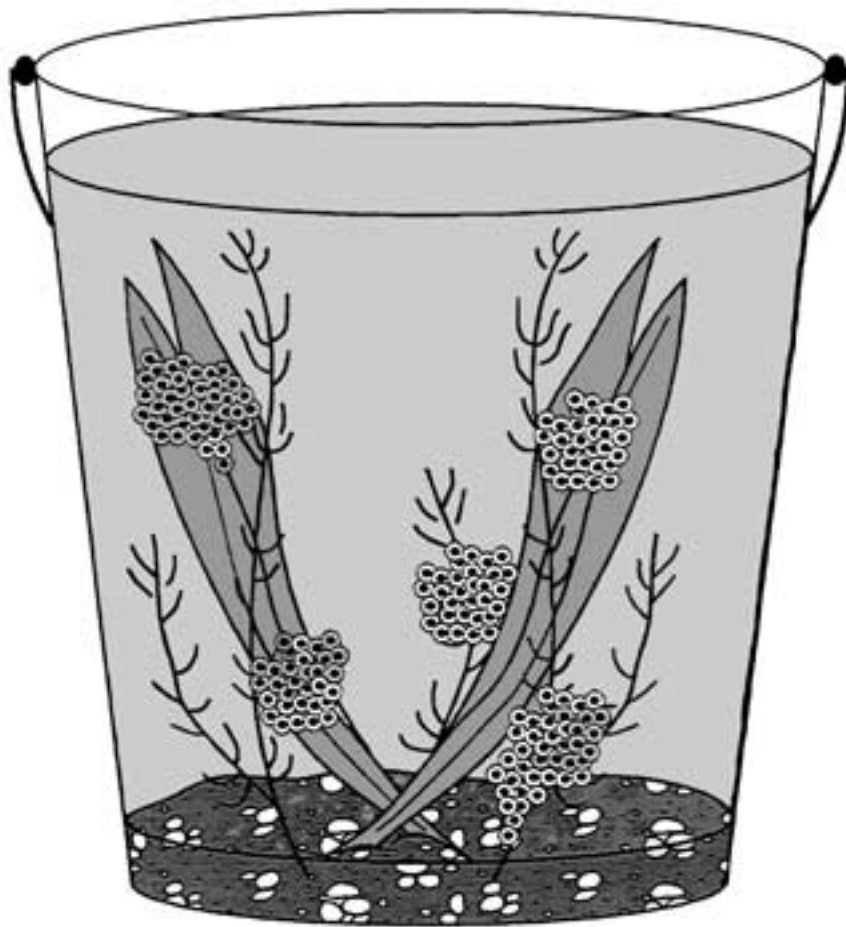
SCIENCE BOOKLET DIRECTIONS, II

You will now work on section 5 in which you will be given a set of materials to do a science activity. You will have 20 minutes to do this activity and answer questions about it. The administrator will tell you when to begin the section.



SAMPLE QUESTIONS

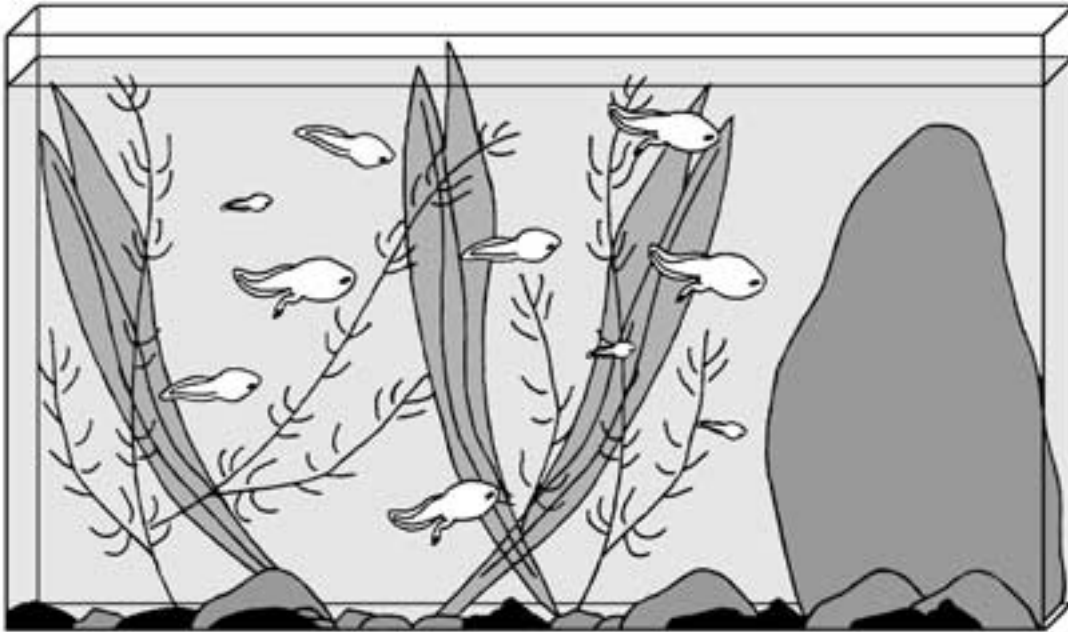
One day Ms. Brown brought a bucket of pond water to her fourth-grade class. In the bucket were several clumps of frogs' eggs—and there were many eggs in each clump, as you can see in Picture 1. "We'll put these eggs and the pond water into the fish tank on the table in the back of the room," said Ms. Brown, "and soon these eggs will hatch into tadpoles. Then we can watch as the tadpoles grow and change into frogs."



Picture 1

Today, two weeks later, all of the eggs that are going to hatch have hatched and the fish tank is full of tadpoles. The last eggs hatched yesterday. As you can see in Picture 2, all the tadpoles do not look alike.

HE001408



Picture 2

1. Draw a circle around each of the tadpoles that hatched yesterday.

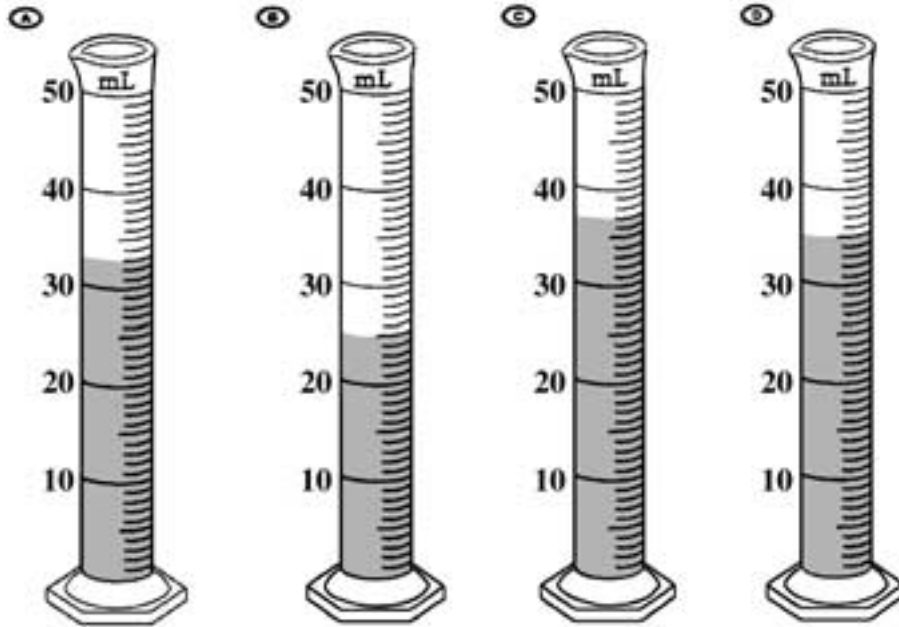
HE001409

2. Tell why all the tadpoles in the fish tank do not look alike.

HE001410

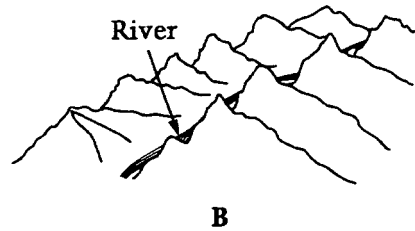
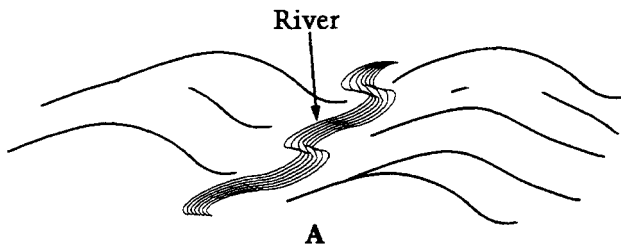
3. The pictures below show containers with water in them. Which container has 35 milliliters (mL) of water in it?

HE001475



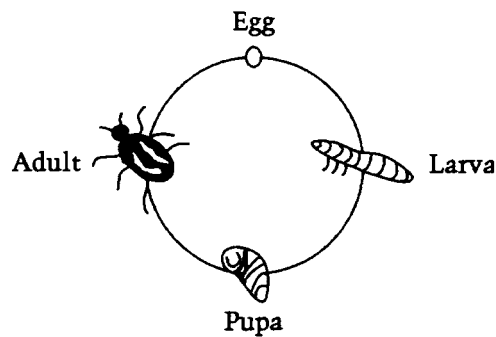
4. The pictures below show the same river and mountains, but one picture shows how they looked millions of years ago, and the other picture shows how they look now. Circle the letter under the picture that shows how the river and mountains look now. Explain how you can tell this.

HE001442



5. We can see the Moon from Earth because the Moon
- Ⓐ is so hot that it glows like the Sun
 - Ⓑ reflects light from the Sun
 - Ⓒ has many volcanoes that give off a glowing gas
 - Ⓓ is made of rocks that give off their own light

HE001431



6. The life cycle of a mealworm is pictured above. What would happen if this larva were eaten by a bird?
- Ⓐ The larva would die before it could reproduce.
 - Ⓑ The bird would become sick.
 - Ⓒ The mealworm species would be wiped out.
 - Ⓓ The mealworm eggs would be spread by the bird.

HE001942

7. Name the parts of the plant below that are labeled 1, 2, and 3. Explain the function of each part.

HE001777



Name of Part

Function

1. _____
2. _____
3. _____

8. Many things are made of metal, such as pots, pans, tools, and wire. Give two reasons why metals are used to make many different things.

HE001976



SCIENCE BACKGROUND QUESTIONNAIRE DIRECTIONS

Sections 3 and 4 consist of background questions. In Section 3, you will answer questions about yourself and your education. Read each question carefully and fill in the oval beside the response that is true for you. Please read and answer the following sample question

How many movies did you see last month on television and in movie theaters?

- ☐ (A) None
- ☐ (B) 1 to 5
- ☐ (C) 6 to 10
- ☐ (D) More than 10.

You should have filled in the oval beside the answer that is true for you.

In section 4 you will answer questions about your science instruction. Some questions are like the following example. Please read these two questions and fill in one oval beneath your answer to each question.

	Often	Sometimes	Never
How often do you read about science for fun?	<input type="radio"/> (A)	<input type="radio"/> (B)	<input type="radio"/> (C)
How often do you work on science projects in school?	<input type="radio"/> (A)	<input type="radio"/> (B)	<input type="radio"/> (C)

For each of these questions, you should have filled in the oval beneath the answer that is true for you.



GENERAL BACKGROUND QUESTIONNAIRE

This section has 17 questions. Mark your answers in your booklet. Fill in only **one** oval for each question

TB003001

TB003101

1. Which best describes you?

- ☐ (A) White (not Hispanic)
- ☐ (B) Black (not Hispanic)
- ☐ (C) Hispanic ("Hispanic" means someone who is from a Mexican, Mexican American, Chicano, Puerto Rican, Cuban, or other Spanish or Hispanic background.)
- ☐ (D) Asian or Pacific Islander ("Asian or Pacific Islander" means someone who is from a Chinese, Japanese, Korean, Filipino, Vietnamese, or other Asian or Pacific Island background.)
- ☐ (E) American Indian or Alaskan Native ("American Indian or Alaskan Native" means someone who is from one of the American Indian tribes, or one of the original people of Alaska.)
- ☐ (F) Other (specify) _____

2. If you are Hispanic, what is your Hispanic background?

- ☐ (A) I am not Hispanic.
- ☐ (B) Mexican, Mexican American, or Chicano
- ☐ (C) Puerto Rican
- ☐ (D) Cuban
- ☐ (E) Other Spanish or Hispanic background

LC000006

3. How long have you lived in the United States?

- ☐ (A) All my life
- ☐ (B) More than 5 years but not all my life
- ☐ (C) 3–5 years
- ☐ (D) Less than 3 years

TB003201

4. How often do the people in your home speak a language other than English?

- ☐ (A) Never
- ☐ (B) Sometimes
- ☐ (C) Always

TB000905

8. Does your family get any magazines regularly?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

HE002534

5. About how many books are in your home?

- ☐ (A) None
- ☐ (B) 1–10 (Few)
- ☐ (C) 11–25 (Enough to fill one shelf)
- ☐ (D) 26–100 (Enough to fill one bookcase)
- ☐ (E) More than 100 (Enough to fill several bookcases)

TB001801

9. On a school day, about how many hours do you usually watch TV or videotapes outside of school hours?

- ☐ (A) None
- ☐ (B) 1 hour or less
- ☐ (C) 2 hours
- ☐ (D) 3 hours
- ☐ (E) 4 hours
- ☐ (F) 5 hours
- ☐ (G) 6 hours or more

TB000901

6. Does your family get a newspaper regularly?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB006601

10. How much time do you usually spend on homework each day?

- ☐ (A) I don't usually have homework assigned.
- ☐ (B) I have homework but I don't usually do it.
- ☐ (C) 1/2 hour or less
- ☐ (D) 1 hour
- ☐ (E) More than 1 hour

TB000903

7. Is there an encyclopedia in your home?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

QK070706

HE002540

11. How many hours of additional reading do you do each week on your own outside school, NOT in connection with school work?

- ☐ (A) None
- ☐ (B) 1–2 hours
- ☐ (C) 3–4 hours
- ☐ (D) 5–6 hours
- ☐ (E) 7–8 hours
- ☐ (F) 9–10 hours
- ☐ (G) more than 10 hours

TS004001

12. How many days of school did you miss last month?

- ☐ (A) None
- ☐ (B) 1 or 2 days
- ☐ (C) 3 or 4 days
- ☐ (D) 5 to 10 days
- ☐ (E) More than 10 days

QK070707

13. Since you started first grade, how many times have you changed schools, not counting when you were promoted to the next grade?

- ☐ (A) None
- ☐ (B) 1
- ☐ (C) 2
- ☐ (D) 3 or more

14. How often do you discuss things you have studied in school with someone at home?

- ☐ (A) Almost every day
- ☐ (B) Once or twice a week
- ☐ (C) Once or twice a month
- ☐ (D) Never or hardly ever

HE002795

15. How often do you use a computer at home for schoolwork?

- ☐ (A) Almost every day
- ☐ (B) Once or twice a week
- ☐ (C) Once or twice a month
- ☐ (D) Never or hardly ever
- ☐ (E) There is no computer at home.

ID110020

16. Do you use the Internet at home?

- ☐ (A) Yes
- ☐ (B) No

HE002541

17. How safe do you feel at school?

- ☐ (A) Very safe
- ☐ (B) Somewhat safe
- ☐ (C) Somewhat unsafe
- ☐ (D) Very unsafe



SCIENCE BACKGROUND QUESTIONNAIRE

This section has 10 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

HE002996

1. How much do you agree with the following statements? Fill in **one** oval on each line.

	Agree	Not Sure	Disagree	
a. I like science.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE002997
b. I am good at science.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE002998
c. Learning science is mostly memorizing.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE002999
d. All students can do well in science if they try.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	QK070708
e. Science is boring.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE003003

HE003005

2. Have you ever done hands-on activities or projects in school with any of the following?
Fill in all ovals that apply.

a. Living things (for example, plants, animals, bacteria)	<input type="radio"/> A	HE003006
b. Electricity (for example, batteries and flashlight bulbs)	<input type="radio"/> A	HE003007
c. Chemicals (for example, mixing or dissolving sugar or salt in water)	<input type="radio"/> A	HE003008
d. Rocks or minerals (for example, identifying types)	<input type="radio"/> A	HE003009
e. Magnifying glass or microscope (for looking at small things)	<input type="radio"/> A	HE003010
f. Thermometer or barometer (for making measurements)	<input type="radio"/> A	HE003011
g. Simple machines (for example, pulleys and levers)	<input type="radio"/> A	HE003012
h. None of the above	<input type="radio"/> A	HE003013

LC000144

3. About how often do you study science in school?

- ☐ (A) Every day
- ☐ (B) 3 or 4 times a week
- ☐ (C) 1 or 2 times a week
- ☐ (D) Less than once a week
- ☐ (E) Never

LC000147

4. Do you ever do science projects in school that take a week or more?

- ☐ (A) Yes
- ☐ (B) No

ID110089

5. When you do science experiments in school, do you use a lab book or notebook for keeping your records and comments?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know

QK070709

6. How hard was this test compared to most other science tests you have taken this year in school?

- ☐ (A) Much harder than other science tests
- ☐ (B) Harder than other science tests
- ☐ (C) About as hard as other science tests
- ☐ (D) Easier than other science tests

QK070710

7. How hard did you try on this test compared to how hard you tried on most other science tests you have taken this year in school?

- ☐ (A) Much harder than on other science tests
- ☐ (B) Harder than on other science tests
- ☐ (C) About as hard as on other science tests
- ☐ (D) Not as hard as on other science tests

QK070711

QK070712

8. How important was it to you to do well on this science test?

- ☐ (A) Very important
- ☐ (B) Important
- ☐ (C) Somewhat important
- ☐ (D) Not very important

9. This year in school, how often have you been asked to write long answers to questions on tests or assignments for science?

- ☐ (A) At least once a week
- ☐ (B) Once or twice a month
- ☐ (C) Once or twice this year
- ☐ (D) Never

ID110144

10. How strongly do you agree with the following statements? Fill in only **one** oval on each line.

- | | Strongly Agree | Agree | Disagree | Strongly Disagree | |
|--|---------------------------|---------------------------|---------------------------|---------------------------|----------|
| a. Doing well in school is a goal of most students in my class. | <input type="radio"/> (A) | <input type="radio"/> (B) | <input type="radio"/> (C) | <input type="radio"/> (D) | ID110146 |
| b. To keep up with my friends, I have to work hard at my schoolwork. | <input type="radio"/> (A) | <input type="radio"/> (B) | <input type="radio"/> (C) | <input type="radio"/> (D) | ID110147 |



GRADE 8

THE MATHEMATICS ASSESSMENT

The NAEP mathematics assessment is based on the National Council of Teachers of Mathematics (NCTM) *Standards*. The specifications focus on five broad content strands of mathematical content: Number Sense, Properties, and Operations; Measurement; Geometry and Spatial Sense; Data Analysis, Statistics, and Probability; and Algebra and Functions. Items are classified according to the major area(s) they address, including both mathematical abilities and mathematical power. Mathematical power consists of math abilities (conceptual understanding, procedural knowledge, and problem solving) within a broader context of reasoning, connections, and communications.

The 2000 NAEP assessment embraces a comprehensive view of mathematics and is based on a model that provides a more holistic and integrated view of school mathematics, requiring students to form networks of connections among mathematical ideas and skills.

The exercise types include multiple-choice items, grid-in items, short-answer open-ended questions, and extended open-ended tasks. These extended exercises allow students to communicate their ideas and demonstrate the reasoning they used to solve problems.

MATHEMATICS BOOKLET DIRECTIONS

This assessment uses many different booklets each with different questions. Do not worry if the person next to you is working on questions that do not look like those you are working on.

Read each question carefully and answer it as well as you can. Do not spend too much time on any one question.

Each booklet has several parts. You will be helped with the first part and will complete the other parts on your own. You will be told when to begin each part. Stop when you see this sign.



If you finish a part early, you may check your work on that part only. Do not begin another part until you are told to continue.

Now read sample 1. The choices for some questions will be written across the page as shown. Fill in the oval for the best answer.

SAMPLE 1 -

	Almost every day	Once or twice a week	Once or twice a month	Never or hardly ever
1. How often do you watch movies on TV?	<input type="radio"/> (A)	<input type="radio"/> (B)	<input type="radio"/> (C)	<input type="radio"/> (D)

There is no correct answer to this question. Your answer will tell us how often you watch movies on TV.

Now read sample 2. Fill in the oval for the choice that you think is correct.

SAMPLE 2

2. How many minutes are there in 2 hours?

- ☐ (A) 12
- ☐ (B) 24
- ☐ (C) 60
- ☐ (D) 120

You should have filled in the oval for “120” because there are 120 minutes in 2 hours.

Now read sample 3 and write your answer on the blank line below.

SAMPLE 3

3. What kind of music do you like best?

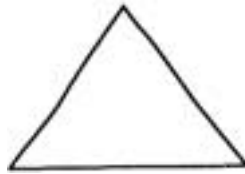
(Write in.) _____

You should answer this question by writing the kind of music you like best. Sometimes there will be more than one line on which to write your answer. Use as many lines as you need for your answer.

Now read sample 4. For some of the questions you may need to write or draw the answer. You can see how this is done in sample 4.

SAMPLE 4

4. Draw a triangle in the space below.



REMEMBER:

Read each question CAREFULLY.

Fill in only ONE OVAL for each question or write your answer in the space provided.

If you change your answer, ERASE your first answer COMPLETELY.

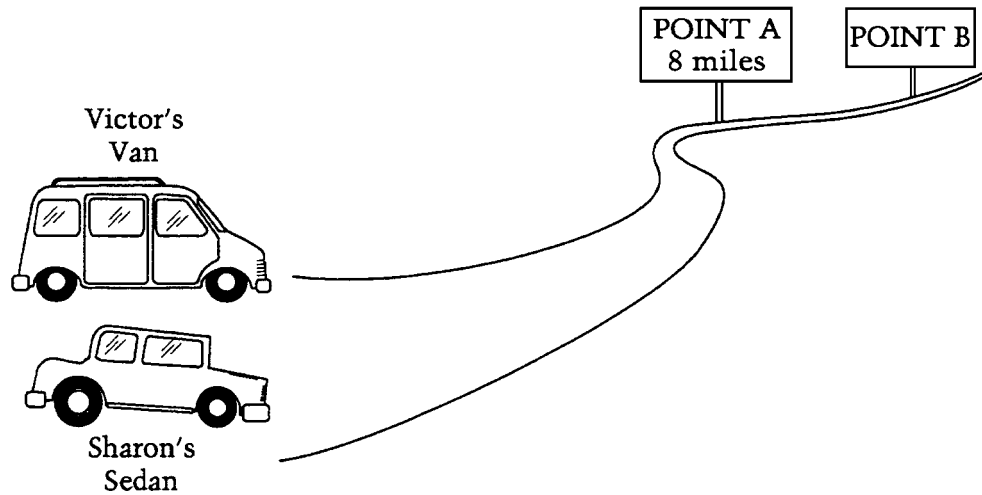
CHECK OVER your work if you finish a section early.



SAMPLE QUESTIONS

1. Of the following, which is the best unit to use when measuring the growth of a plant every other day during a 2-week period?
- Ⓐ Centimeter
 - Ⓑ Meter
 - Ⓒ Kilometer
 - Ⓓ Foot
 - Ⓔ Yard

HW000842



2. Victor's van travels at a rate of 8 miles every 10 minutes. Sharon's sedan travels at a rate of 20 miles every 25 minutes.

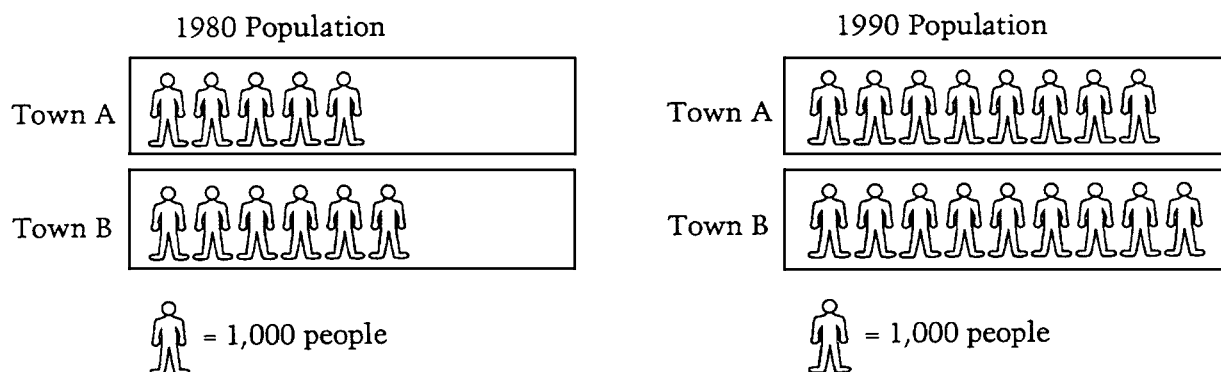
If both cars start at the same time, will Sharon's sedan reach point A, 8 miles away, before, at the same time, or after Victor's van?

Explain your reasoning.

If both cars start at the same time, will Sharon's sedan reach point B (at a distance further down the road) before, at the same time, or after Victor's van?

Explain your reasoning.

AP000717



3. In 1980, the populations of Town A and Town B were 5,000 and 6,000, respectively. The 1990 populations of Town A and Town B were 8,000 and 9,000, respectively.

Brian claims that from 1980 to 1990 the populations of the two towns grew by the same amount. Use mathematics to explain how Brian might have justified his claim.

Darlene claims that from 1980 to 1990 the population of Town A had grown more. Use mathematics to explain how Darlene might have justified her claim.

HW000863

4. A plumber charges customers \$48 for each hour worked plus an additional \$9 for travel. If h represents the number of hours worked, which of the following expressions could be used to calculate the plumber's total charge in dollars?

- (A) $48 + 9 + h$
- (B) $48 \times 9 \times h$
- (C) $48 + (9 \times h)$
- (D) $(48 \times 9) + h$
- (E) $(48 \times h) + 9$

N255101

5. Jaime knows the following facts about points A , B , and C .

- Points A , B , and C are on the same line, but might not be in that order.
- Point C is twice as far from point A as it is from point B .

Jaime concluded that point C is always between points A and B .

Is Jaime's conclusion correct?

- (A) Yes
- (B) No

In the space provided, use a diagram to explain your answer.

Y002259



GENERAL BACKGROUND QUESTIONNAIRE

This section has 20 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

TB003001

TB003101

1. Which best describes you?

- ☐ (A) White (not Hispanic)
- ☐ (B) Black (not Hispanic)
- ☐ (C) Hispanic ("Hispanic" means someone who is from a Mexican, Mexican American, Chicano, Puerto Rican, Cuban, or other Spanish or Hispanic background.)
- ☐ (D) Asian or Pacific Islander ("Asian or Pacific Islander" means someone who is from a Chinese, Japanese, Korean, Filipino, Vietnamese, or other Asian or Pacific Island background.)
- ☐ (E) American Indian or Alaskan Native ("American Indian or Alaskan Native" means someone who is from one of the American Indian tribes, or one of the original people of Alaska.)
- ☐ (F) Other (specify) _____

2. If you are Hispanic, what is your Hispanic background?

- ☐ (A) I am not Hispanic.
- ☐ (B) Mexican, Mexican American, or Chicano
- ☐ (C) Puerto Rican
- ☐ (D) Cuban
- ☐ (E) Other Spanish or Hispanic background

LC000006

3. How long have you lived in the United States?

- ☐ (A) All my life
- ☐ (B) More than 5 years but not all my life
- ☐ (C) 3–5 years
- ☐ (D) Less than 3 years

TB003201

4. How often do the people in your home speak a language other than English?

- ☐ (A) Never
- ☐ (B) Sometimes
- ☐ (C) Always

TB000901

7. Does your family get a newspaper regularly?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB003501

5. How far in school did your mother go?

- ☐ (A) She did not finish high school.
- ☐ (B) She graduated from high school.
- ☐ (C) She had some education after high school.
- ☐ (D) She graduated from college.
- ☐ (E) I don't know.

TB000903

8. Is there an encyclopedia in your home?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB003601

6. How far in school did your father go?

- ☐ (A) He did not finish high school.
- ☐ (B) He graduated from high school.
- ☐ (C) He had some education after high school.
- ☐ (D) He graduated from college.
- ☐ (E) I don't know.

TB000904

9. Are there more than 25 books in your home?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB000905

10. Does your family get any magazines regularly?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB001801

11. How much television do you usually watch each day?

- ☐ (A) None
- ☐ (B) 1 hour or less
- ☐ (C) 2 hours
- ☐ (D) 3 hours
- ☐ (E) 4 hours
- ☐ (F) 5 hours
- ☐ (G) 6 hours or more

TB006601

12. How much time do you usually spend on homework each day?

- ☐ (A) I don't usually have homework assigned.
- ☐ (B) I have homework but I don't usually do it.
- ☐ (C) 1/2 hour or less
- ☐ (D) 1 hour
- ☐ (E) More than 1 hour

TB001101

13. About how many pages a day do you have to read in school and for homework?

- ☐ (A) More than 20
- ☐ (B) 16–20
- ☐ (C) 11–15
- ☐ (D) 6–10
- ☐ (E) 5 or fewer

TS004001

14. How many days of school did you miss last month?

- ☐ (A) None
- ☐ (B) 1 or 2 days
- ☐ (C) 3 or 4 days
- ☐ (D) 5 to 10 days
- ☐ (E) More than 10 days

HE000712

15. Within the past two years, how many times have you changed schools because you changed where you lived?

- ☐ (A) None
- ☐ (B) 1
- ☐ (C) 2
- ☐ (D) 3 or more

HE000717

16. How often do you discuss things you have studied in school with someone at home?

- ☐ (A) Almost every day
- ☐ (B) Once or twice a week
- ☐ (C) Once or twice a month
- ☐ (D) Never or hardly ever

HE002795

17. How often do you use a computer at home for schoolwork?

- Ⓐ Almost every day
- Ⓑ Once or twice a week
- Ⓒ Once or twice a month
- Ⓓ Never or hardly ever
- Ⓔ There is no computer at home.

ID110020

18. Do you use the Internet at home?

- Ⓐ Yes
- Ⓑ No

HE002541

19. How safe do you feel at school?

- Ⓐ Very safe
- Ⓑ Somewhat safe
- Ⓒ Somewhat unsafe
- Ⓓ Very unsafe

QK070697

20. How much education do you think you will complete?

- Ⓐ I will not finish high school.
- Ⓑ I will graduate from high school.
- Ⓒ I will have some education after high school.
- Ⓓ I will graduate from college.
- Ⓔ I will go to graduate school.
- Ⓕ I don't know.



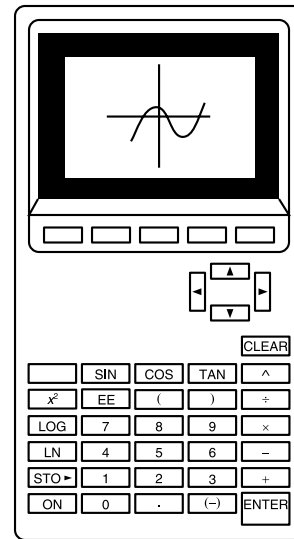
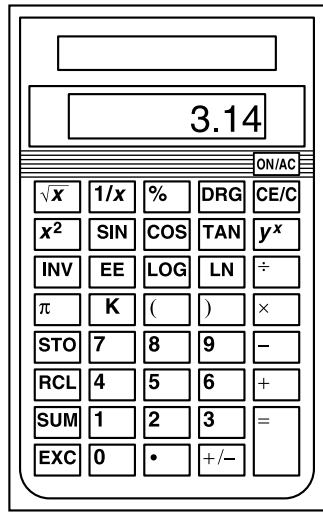
MATHEMATICS BACKGROUND QUESTIONNAIRE

This section has 10 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

UH000080

1. When you do mathematics in school, how often do you do each of the following? Fill in only **one** oval on each line.

	Almost Every Day	Once or Twice a Week	Once or Twice a Month	Never or Hardly Ever	
a. Do mathematics problems from textbooks	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810101
b. Solve mathematics problems with a partner or in small groups	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	HE002478
c. Work with measuring instruments or geometric solids	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810104
d. Write a few sentences about how you solved a mathematics problem	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810109
e. Talk with other students during class about how you solved mathematics problems	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070695
f. Use a computer	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810106
g. Use a calculator	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	TM810105



2. A calculator like the one shown above is a scientific calculator. It has keys with labels \sqrt{x} , \ln , π , \cos . Do you use a scientific calculator for your mathematics schoolwork?

- (A) Yes
(B) No

HE002485

3. A calculator like the one shown above is a graphing calculator. It can draw a graph in the viewing window. Do you use a graphing calculator for your mathematics schoolwork?

- (A) Yes
(B) No

ID110100

F1 ▼	F2 ▼ Algebra	F3 ▼ Calc	F4 ▼	F5	F6
• solve($x^2 - 1 = 2, x$) $x = \sqrt[3]{3}$ or $x = \sqrt{3}$ • solve($z^y + 3 = \sin(x), y$) $y = \frac{1n(\sin(x) - 3)}{1n(z)}$ and $\sin(x) \geq 3$ • cSolve($x^2 + 1 = 0, x$) $x = i$ or $x = -i$ • solve($x^3 - 5 \cdot x^2 + 2 = 4, x$) $x = 5.07757422305$					
MAIN		RAD AUTO		FUNC	

4. A calculator that can do what is shown above is called a symbol manipulator or a computer algebra system. It can work with algebraic expressions directly, and it also has all the functions of graphing calculators. Do you use a symbol manipulator for your mathematics schoolwork?

- ☐ A Yes
- ☐ B No

LC000518

5. For mathematics, how often do you use a calculator for each of the following activities? Fill in **one** oval on each line.

	Almost Every Day	Once or Twice a Week	Once or Twice a Month	Never or Hardly Ever	
a. Classwork	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	LC000519
b. Homework	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	LC000520

QK070698

6. How often does your teacher let you use a calculator for tests or quizzes?

- Ⓐ Always
- Ⓑ Sometimes
- Ⓒ Never

QK070701

7. What mathematics class are you taking this year?

- Ⓐ Eighth-grade mathematics
- Ⓑ Prealgebra
- Ⓒ First-year algebra
- Ⓓ Geometry
- Ⓔ Second-year algebra
- Ⓕ Integrated or sequential mathematics
- Ⓖ Other mathematics class

QK070700

8. What mathematics class do you expect to take in ninth grade?

- Ⓐ Basic, general, business, or consumer mathematics
- Ⓑ Applied mathematics (technical preparation)
- Ⓒ Prealgebra
- Ⓓ First-year algebra
- Ⓔ Geometry
- Ⓕ Second-year algebra
- Ⓖ Integrated or sequential mathematics
- Ⓗ Other mathematics class
- Ⓘ I don't know.

QK070705

9. About how much time do you usually spend each day on mathematics homework?

- Ⓐ None
- Ⓑ 15 minutes
- Ⓒ 30 minutes
- Ⓓ 45 minutes
- Ⓔ One hour
- Ⓕ More than one hour

HE000659

10. How much do you agree with each of the following statements? Fill in **one** oval on each line.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	
a. I like mathematics.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	<input type="radio"/> E	TM810701
b. I am good at mathematics.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	<input type="radio"/> E	LD001476
c. I understand most of what goes on in mathematics class.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	<input type="radio"/> E	HE000369
d. There is only one correct way to solve a mathematics problem.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	<input type="radio"/> E	LD001473
e. Learning mathematics is mostly memorizing facts.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	<input type="radio"/> E	HE000631
f. Mathematics is useful for solving everyday problems.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	<input type="radio"/> E	TM810705
g. All students can do well in mathematics if they try.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	<input type="radio"/> E	QK070699

This section has 3 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

QK070694

LD001718

1. How hard did you try on this test?

- ☐ (A) Much harder than on other mathematics tests
- ☐ (B) Harder than on other mathematics tests
- ☐ (C) About as hard as on other mathematics tests
- ☐ (D) Not as hard as on other mathematics tests

2. How important was it to you to do well on this mathematics test?

- ☐ (A) Very important
- ☐ (B) Important
- ☐ (C) Somewhat important
- ☐ (D) Not very important

ID110144

3. How strongly do you agree with the following statements? Fill in only **one** oval on each line.

- | | Strongly
Agree | Agree | Disagree | Strongly
Disagree | |
|--|---------------------------|---------------------------|---------------------------|---------------------------|----------|
| a. Doing well in school is a goal of most students in my class. | <input type="radio"/> (A) | <input type="radio"/> (B) | <input type="radio"/> (C) | <input type="radio"/> (D) | ID110146 |
| b. To keep up with my friends, I have to work hard at my schoolwork. | <input type="radio"/> (A) | <input type="radio"/> (B) | <input type="radio"/> (C) | <input type="radio"/> (D) | ID110147 |



THE SCIENCE ASSESSMENT

The NAEP science assessment is organized according to two major dimensions: the fields of science (Earth, Physical, and Life) and knowing and doing science (Conceptual Understanding, Scientific Investigation, and Practical Reasoning). In addition, embedded within both dimensions are three themes of science (Models, Systems, and Patterns of Change) and the Nature of Science.

The 2000 NAEP assessment in science contains multiple-choice questions as well as short and extended constructed-response exercises. These questions explore students' abilities to explain, integrate, apply, reason, plan, design, evaluate, and communicate. The constructed-response questions make up approximately 80 percent of the assessment time.

The assessment is made up of discrete questions; clusters of questions that test in-depth knowledge of a number of content areas including those contained within models, systems, and patterns of change; and performance-based tasks that probe students' abilities to make observations, perform investigations, evaluate experimental results, and apply problem-solving skills.


Each student who participates in the assessment will take two timed blocks of questions. In addition, half the sampled students will take a third timed block of questions consisting of a set of hands-on problem-solving tasks.

**Distribution of NAEP Science Framework Assessment Time
Across Field of Science**

	Earth Science includes astronomy, geology, meteorology, and oceanography	Physical Science includes physics and chemistry	Life Science includes biology, health, and nutrition
Grade 4	33%	33%	33%
Grade 8	30%	30%	40%
Grade 12	33%	33%	33%

SCIENCE BOOKLET DIRECTIONS, I

Your book has either 4 or 5 sections. Sections 1 and 2 contain science questions; sections 3 and 4 ask questions about you and your classes. For those of you who have 5 sections, section 5 contains a hands-on science task. The administrator will tell you when to begin each section.

Do not go past the  sign at the end of each section until you are told to do so.

If you finish a section before time is called, you may go back and check your work on that section only. Use your time carefully and answer as many questions as you can in each section.

In each of sections 1 and 2, you will have 30 minutes to answer a series of questions about science.

You will be asked to respond to several different types of questions. Some of the questions will require you to choose the best answer and fill in the oval for that answer in your booklet. On questions like this, be sure to mark your answers clearly and darken the oval completely. If you make a mistake or want to change your answer, be sure to erase any unwanted marks. Here is an example of a question that requires you to fill in an oval.

Example 1

James found that certain objects were attracted to a magnet. Which of these objects clung to his magnet?

- ☐ (A) Rubber band
- ☐ (B) Wooden toothpick
- ☐ (C) Plastic cup
- ☒ (D) Steel paper clip

For some questions, you will be asked to write short answers on the blank lines provided in your booklet. Here is an example of a question that requires you to provide a short answer.

Example 2

Describe one important difference between plants and animals.

Most plants make their own food, while animals eat plants and other animals for food.

Also, you will be asked to answer some questions by writing longer, more detailed responses. For example, here is a question that requires you to provide a longer answer.

Example 3

Describe three things that animals do to survive in areas that have cold winters.

Some animals store a lot of fat so that they can go into a deep sleep all winter. Some animals grow a thick coat of fur to keep them warm. Some birds and butterflies fly away from a cold area and spend the winter in a place that is warm and has a lot of food.

When you are asked to write your response be sure that your handwriting is clear. Think carefully about each question and make your answers as complete as possible, using as many lines as you need.

Finally, in some questions you may be asked to draw a diagram or fill in a table.



SCIENCE BOOKLET DIRECTIONS, II

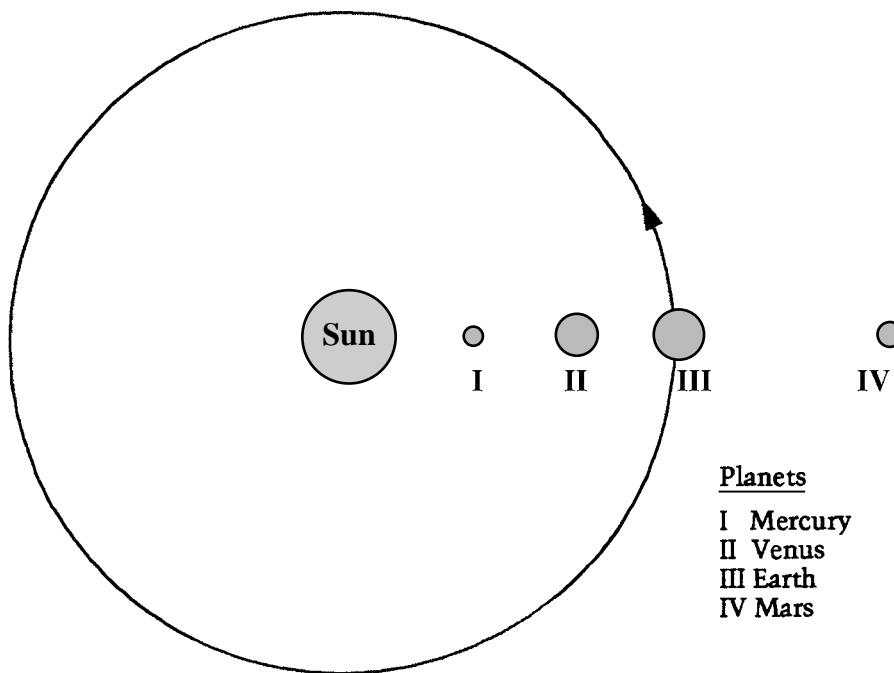
You will now work on section 5 in which you will be given a set of materials to do a science activity. You will have 30 minutes to do this activity and answer questions about it. The administrator will tell you when to begin the section.



SAMPLE QUESTIONS

The picture below illustrates a simplified model of part of the Solar System. The Sun and the four planets closest to the Sun are represented by the shaded figures. The Earth's orbit (the path that it takes as it moves around the Sun) is represented by the large circle and the arrow on this circle shows the direction in which the Earth moves.

HE001310



1. Complete the simple model of the Solar System by drawing the paths that Mercury, Venus, and Mars take as they move around the Sun. Draw arrows on the paths to show the direction in which each moves.

HE001311

2. State two ways, other than the planets being in the correct order, in which this simple model is like the real Solar System. HE001313

3. Which of the following properties of the Earth is the result of the processes of living things?

- Ⓐ The Earth's oceans are salty.
- Ⓑ The Earth has magnetic poles.
- Ⓒ The Earth's atmosphere contains a lot of oxygen.
- Ⓓ The Earth's crust contains a lot of volcanic rock.

JL001087

4. Raul's little sister, Sarah, wants to know why she can see herself in a mirror, but she can see through a window. What should Raul tell his sister to explain the differences between mirrors and windows?

HE001481

5. Hair color in humans is an inherited trait. How is it possible for two people who had brown hair from birth to produce a child with blond hair?

JL001033

6. A certain organism has many cells, each containing a nucleus. If the organism makes its own food, it would be classified as

Ⓐ a bacterium
Ⓑ a fungus
Ⓒ a plant
Ⓓ an animal

HE001824

7. An insulated bottle keeps a cold liquid in the bottle cold by

Ⓐ destroying any heat that enters the bottle
Ⓑ keeping cold energy within the bottle
Ⓒ trapping dissolved air in the liquid
Ⓓ slowing the transfer of heat into the bottle

HE001728



SCIENCE BACKGROUND QUESTIONNAIRE DIRECTIONS

Sections 3 and 4 consist of background questions. In Section 3, you will answer questions about yourself and your education. Read each question carefully and fill in the oval beside the response that is true for you. Please read and answer the following sample question

How many movies did you see last month on television and in movie theaters?

- ☐ A None
- ☐ B 1 to 5
- ☐ C 6 to 10
- ☐ D More than 10.

You should have filled in the oval beside the answer that is true for you.

In section 4 you will answer questions about your science instruction. Some questions are like the following example. Please read these two questions and fill in one oval beneath your answer to each question.

	Often	Sometimes	Never
How often do you read about science for fun?	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C
How often do you work on science projects in school?	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C

For each of these questions, you should have filled in the oval beneath the answer that is true for you.



GENERAL BACKGROUND QUESTIONNAIRE

This section has 20 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

TB003001

TB003101

1. Which best describes you?

- ☐ (A) White (not Hispanic)
- ☐ (B) Black (not Hispanic)
- ☐ (C) Hispanic (“Hispanic” means someone who is from a Mexican, Mexican American, Chicano, Puerto Rican, Cuban, or other Spanish or Hispanic background.)
- ☐ (D) Asian or Pacific Islander (“Asian or Pacific Islander” means someone who is from a Chinese, Japanese, Korean, Filipino, Vietnamese, or other Asian or Pacific Island background.)
- ☐ (E) American Indian or Alaskan Native (“American Indian or Alaskan Native” means someone who is from one of the American Indian tribes, or one of the original people of Alaska.)
- ☐ (F) Other (specify) _____

2. If you are Hispanic, what is your Hispanic background?

- ☐ (A) I am not Hispanic.
- ☐ (B) Mexican, Mexican American, or Chicano
- ☐ (C) Puerto Rican
- ☐ (D) Cuban
- ☐ (E) Other Spanish or Hispanic background

LC000006

3. How long have you lived in the United States?

- ☐ (A) All my life
- ☐ (B) More than 5 years but not all my life
- ☐ (C) 3–5 years
- ☐ (D) Less than 3 years

TB003201

4. How often do the people in your home speak a language other than English?

- ☐ (A) Never
- ☐ (B) Sometimes
- ☐ (C) Always

HE002514

5. How much education did your mother receive? ("Mother" can be a mother, step-mother, or female guardian.)

- ☐ (A) She did not finish high school.
- ☐ (B) She graduated from high school.
- ☐ (C) She had some education after high school.
- ☐ (D) She graduated from college.
- ☐ (E) I don't know.

HE002515

6. How much education did your father receive? ("Father" can be a father, stepfather, or male guardian.)

- ☐ (A) He did not finish high school.
- ☐ (B) He graduated from high school.
- ☐ (C) He had some education after high school.
- ☐ (D) He graduated from college.
- ☐ (E) I don't know.

HE002534

7. About how many books are in your home?

- ☐ (A) None
- ☐ (B) 1–10 (Few)
- ☐ (C) 11–25 (Enough to fill one shelf)
- ☐ (D) 26–100 (Enough to fill one bookcase)
- ☐ (E) More than 100 (Enough to fill several bookcases)

TB000901

8. Does your family get a newspaper regularly?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB000903

9. Is there an encyclopedia in your home?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB000905

10. Does your family get any magazines regularly?

- ☐ (A) Yes
- ☐ (B) No
- ☐ (C) I don't know.

TB001801

QK070706

11. On a school day, about how many hours do you usually watch TV or videotapes outside of school hours?

- (A) None
- (B) 1 hour or less
- (C) 2 hours
- (D) 3 hours
- (E) 4 hours
- (F) 5 hours
- (G) 6 hours or more

13. How many hours of additional reading do you do each week on your own outside school, NOT in connection with school work?

- (A) None
- (B) 1–2 hours
- (C) 3–4 hours
- (D) 5–6 hours
- (E) 7–8 hours
- (F) 9–10 hours
- (G) More than 10 hours

TB006601

TS004001

12. How much time do you usually spend on homework each day?

- (A) I don't usually have homework assigned.
- (B) I have homework but I don't usually do it.
- (C) 1/2 hour or less
- (D) 1 hour
- (E) More than 1 hour

14. How many days of school did you miss last month?

- (A) None
- (B) 1 or 2 days
- (C) 3 or 4 days
- (D) 5 to 10 days
- (E) More than 10 days

QK070707

ID110020

15. Since you started first grade, how many times have you changed schools, not counting when you were promoted to the next grade?

- ☐ (A) None
- ☐ (B) 1
- ☐ (C) 2
- ☐ (D) 3
- ☐ (E) 4
- ☐ (F) 5
- ☐ (G) 6
- ☐ (H) 7 or more

HE002540

16. How often do you discuss things you have studied in school with someone at home?

- ☐ (A) Almost every day
- ☐ (B) Once or twice a week
- ☐ (C) Once or twice a month
- ☐ (D) Never or hardly ever

HE002795

17. How often do you use a computer at home for schoolwork?

- ☐ (A) Almost every day
- ☐ (B) Once or twice a week
- ☐ (C) Once or twice a month
- ☐ (D) Never or hardly ever
- ☐ (E) There is no computer at home.

18. Do you use the Internet at home?

- ☐ (A) Yes
- ☐ (B) No

HE002541

19. How safe do you feel at school?

- ☐ (A) Very safe
- ☐ (B) Somewhat safe
- ☐ (C) Somewhat unsafe
- ☐ (D) Very unsafe

QK070697

20. How much education do you think you will complete?

- ☐ (A) I will not finish high school.
- ☐ (B) I will graduate from high school.
- ☐ (C) I will have some education after high school.
- ☐ (D) I will graduate from college.
- ☐ (E) I will go to graduate school.
- ☐ (F) I don't know.



SCIENCE BACKGROUND QUESTIONNAIRE

This section has 16 questions. Mark your answers in your booklet. Fill in only **one** oval for each question.

HE002996

1. How much do you agree with the following statements? Fill in **one** oval on each line.

	Agree	Not Sure	Disagree	
a. I like science.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE002997
b. I am good at science.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE002998
c. Learning science is mostly memorizing.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE002999
d. All students can do well in science if they try.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	QK070708
e. Science is boring.	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	HE003003

HE003005

2. Have you ever done hands-on activities or projects in school with any of the following? Fill in **all** ovals that apply.

a. Living things (for example, plants, animals, bacteria)	<input type="radio"/> A	HE003006	e. Magnifying glass or microscope (for looking at small things)	<input type="radio"/> A	HE003010
b. Electricity (for example, batteries and flashlight bulbs)	<input type="radio"/> A	HE003007	f. Thermometer or barometer (for making measurements)	<input type="radio"/> A	HE003011
c. Chemicals (for example, mixing or dissolving sugar or salt in water)	<input type="radio"/> A	HE003008	g. Simple machines (for example, pulleys and levers)	<input type="radio"/> A	HE003012
d. Rocks or minerals (for example, identifying types)	<input type="radio"/> A	HE003009	h. None of the above	<input type="radio"/> A	HE003013

LC000166

3. Which best describes the science course you are taking?

- ☐ (A) I am not taking a science course this year.
- ☐ (B) Life science (for example, biology)
- ☐ (C) Physical science (for example, physics or chemistry)
- ☐ (D) Earth science (for example, geology or astronomy)
- ☐ (E) General science (several content areas of science taught separately)
- ☐ (F) Integrated science (several content areas of science combined and taught together throughout the year)

WO001050

4. If you are taking a science course this year, about how much time do you spend doing science homework each week?

- ☐ (A) I am not taking a science course.
- ☐ (B) None
- ☐ (C) 1/2 hour
- ☐ (D) 1 hour
- ☐ (E) 2 hours
- ☐ (F) 3 hours
- ☐ (G) More than 3 hours

LC000147

5. Do you ever do science projects in school that take a week or more?

- ☐ (A) Yes
- ☐ (B) No

WO001032

6. In the last two years, have you participated in a science fair, festival, or special science day?

- ☐ (A) Yes
- ☐ (B) No

QK070714

7. When you do science experiments or investigations in school, do you use a lab book or notebook for keeping your records, logs, and comments?

- ☐ (A) I am not taking science this year.
- ☐ (B) Yes
- ☐ (C) No
- ☐ (D) I don't know

QK070681

8. About how often do you do each of the following in your class? Fill in only **one** oval on each line.

	I am Not Taking Science	Once a Month or More	Sometimes but Less than Once a Month	Never	
a. Design your own science experiment or investigation	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070682
b. Carry out the science experiment or investigation you designed	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070683
c. Write up the results of the experiment or investigation you designed	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070684
d. Talk to the class about the results of your experiment or investigation	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070685

QK070686

9. When you work on science experiments or investigations do you usually work with other students?

- ☐ A I am not taking science this year.
- ☐ B Yes
- ☐ C No
- ☐ D We do not do science experiments or investigations in class.

QK070687

10. In your science class this year, does your teacher ask you to make comments or suggestions about other students' experiments or investigation?

- ☐ A I am not taking science this year.
- ☐ B Yes
- ☐ C No
- ☐ D We do not do science experiments or investigations in class.

QK070688

11. If you are taking a science class this year, about how often did you use a computer to do the following? Fill in only **one** oval on each line.

	I am Not Taking Science	Once a Month or More	Sometimes but Less than Once a Month	Never	
a. Collect data using lab equipment that interfaces with computers (for example, probes)	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070690
b. Download data and related information from the Internet	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070689
c. Analyze data using the computer	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070691
d. Use the Internet to exchange information with other students or scientists about science experiments or investigations	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	QK070692

QK070709

QK070710

12. How hard was this test compared to most other science tests you have taken this year in school?

- ☐ A Much harder than other science tests
- ☐ B Harder than other science tests
- ☐ C About as hard as other science tests
- ☐ D Easier than other science tests

13. How hard did you try on this test compared to how hard you tried on most other science tests you have taken this year in school?

- ☐ A Much harder than on other science tests
- ☐ B Harder than on other science tests
- ☐ C About as hard as on other science tests
- ☐ D Not as hard as on other science tests

QK070711

QK070712

14. How important was it to you to do well on this science test?

- ☐ (A) Very important
- ☐ (B) Important
- ☐ (C) Somewhat important
- ☐ (D) Not very important

15. This year in school, how often have you been asked to write long answers to questions on tests or assignments for science?

- ☐ (A) At least once a week
- ☐ (B) Once or twice a month
- ☐ (C) Once or twice this year
- ☐ (D) Never

ID110144

16. How strongly do you agree with the following statements? Fill in only **one** oval on each line.

- | | Strongly
Agree | Agree | Disagree | Strongly
Disagree |
|--|---------------------------|---------------------------|---------------------------|------------------------------|
| a. Doing well in school is a goal of most students in my class. | <input type="radio"/> (A) | <input type="radio"/> (B) | <input type="radio"/> (C) | <input type="radio"/> (D) |
| b. To keep up with my friends, I have to work hard at my schoolwork. | <input type="radio"/> (A) | <input type="radio"/> (B) | <input type="radio"/> (C) | <input type="radio"/> (D) |

ID110146

ID110147



National Assessment of Educational Progress
2000 Assessment
Mathematics and Science

**Information about National Assessment of
Educational Progress**

PROJECT MISSION. NAEP is authorized by Congress and directed and funded by the U.S. Department of Education (National Center for Education Statistics) to report on what American students know and can do in key academic subjects. It has produced more than 200 reports in its 30-year history, chronicling trends over time in the performance of 9-, 13-, and 17-year-old and fourth-, eighth-, and twelfth-grade students. The results are reported in the aggregate for large groups; no student or school data are reported. Information is reported by average proficiency; racial/ethnic and gender status; region; type of school; parent's education level; teachers' emphases; and a variety of home and school supports for learning. It is important to note that student participation is voluntary and confidential. No student's names are ever removed from the school.

THE CONTENT OF NAEP. By law, for each subject assessed, the National Assessment Governing Board (NAGB) manages the development of frameworks detailing what students reasonably might be expected to know and do. These frameworks are the "blueprints" for developing tasks that measure the content specified. Schools selected for the 2000 assessment will receive NAEP's frameworks for mathematics, science, and reading. For information on additional framework development, please contact Mary Crovo of the National Assessment Governing Board at 202-357-6941.

EXAMINATION OF SECURE NAEP ITEMS. Within the limits of staff and resources, procedures have been developed that will enable small groups of members of the public to review the NAEP questions that will be administered in 2000. These arrangements must be made in advance of the local administration date(s) so that sufficient materials can be available and interested persons can be notified about the location and time of the examination. Those persons reviewing the assessment may not, however, remove the booklets from the room, copy them, or take notes. These requests may be made to the NAEP data collection staff, or by contacting the National Center for Education Statistics at 202-219-1831.

OBTAINING NAEP QUESTIONS. Most NAEP questions and tasks are not generally released to the public, because these materials are reused in future assessments, and thus must be kept secure if the project is to accurately report trends in academic performance. However, a portion of each assessment is designated for public release and each NAEP report contains a sample of actual test questions. The questions released for public and research use can be obtained from the National Center for Education Statistics, NAEP Released Exercises, 555 New Jersey Avenue, NW, Washington, DC 20208-5653. Also, previously released questions may be viewed on and downloaded from the NCES Web site at <http://nces.ed.gov/nationsreportcard>.

FOR FURTHER INFORMATION. For prompt field staff support on the above-mentioned matters, or any other concerns, please call 800-283-6237.